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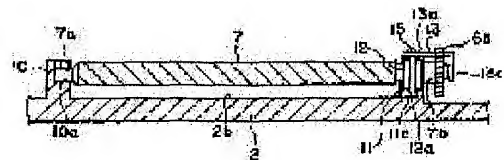
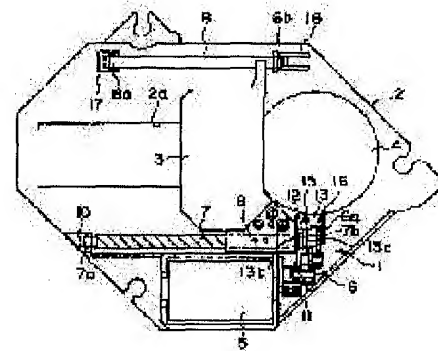
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(54) PICKUP DRIVING MECHANISM

(57)Abstract:

PURPOSE: To obtain a pickup driving mechanism which has an improved bearing construction for a lead screw or a guide shaft which moves a pickup.

CONSTITUTION: A pickup driving mechanism 1 is composed of a pickup driving motor 5 which is provided on the lower surface of a base 2, a transmission mechanism 6 composed of a plurality of gears, a lead screw 7 which is driven through the transmission mechanism 6 and a guide shaft 8 which is so extended as to be in parallel with the lead screw 7 and guides a pickup 3. One end 7a of the lead screw 7 is inserted into the shaft supporting part 10a of a first bearing 10 and supported and the other end 7b is supported by the shaft supporting part 11a of a second bearing 11. The other end 7b of the lead screw 7 is supported in the shaft supporting part 11a by the first leaf spring part 13b of a pressing member 13 through a flange member 12 and, further, pressed against the first bearing 10 side by the second leaf spring part 13c of the pressing member 13 and held so as to rotate freely.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] this invention relates to the pickup drive which drives the pickup which detects the information which starts a pickup drive, especially was recorded on the disk.

[0002]

[Description of the Prior Art] For example, as a storage which makes informations, such as a database and software, memorize, the compact disk (the diameter of 12cm or 8cm) played by laser formula pickup is being used. Therefore, the development of the built type CD-ROM drive equipment built in in a case is performed so that it can include in the miniaturized notebook sized personal computer.

[0003] The pickup drive for driving the pickup which detects the information recorded on the disk is formed in this kind of equipment. A pickup drive consists of the pickup which carries out the outgoing radiation of the profile and the laser beam, the leading screw which engages with the side face of pickup, the bearing make free the bearing of the rotation of a leading screw of, a gear group which drives a leading screw, and a motor made to rotate a leading screw through a gear group.

[0004] And the plain bearing which has the bearing section penetrated so that the edge of a leading screw might be inserted in was conventionally used for bearing. Therefore, in case the edge of a leading screw is made to insert in the bearing section of bearing after fixing a plain bearing to the base, you have to leave the space for the same length as a leading screw to the shaft orientations of bearing.

[0005]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned pickup drive, since installation space was reduced with the miniaturization of a disk unit, other parts will be prepared also near the leading screw, it was hard coming to carry out the work at the time of attaching a leading screw, and assembly operation had taken time.

[0006] Moreover, after attaching a pickup drive in a chassis, when a leading screw needed to damage and exchange, the whole pickup drive had to be exchanged and exchange work of a leading screw was quite troublesome. Then, this invention aims at offering the pickup drive which solved the above-mentioned technical problem.

[0007]

[Means for Solving the Problem] The pickup which detects the information by which this invention was recorded on the disk as a record medium, The leading screw which engages with this pickup, and the guide shaft which guides this pickup, In the pickup drive which has the bearing which carries out the bearing of this leading screw or the guide shaft, is made to rotate this leading screw, and is made to move this pickup to the disk radial It is characterized by preparing opening which is open for free passage among the bearing section of the aforementioned bearing, and coming to prepare the press member which presses the aforementioned leading screw or guide shaft inserted in this bearing section from this opening among the aforementioned bearing section in the aforementioned opening.

[0008]

[Function] Since it is enabled to insert a leading screw or a guide shaft in the bearing section from opening in which it was prepared by bearing, assembly operation of a leading screw or a guide shaft can be performed easily, and exchange work of a leading screw or a guide shaft can also be performed for a short time.

[0009]

[Example] One example of the pickup drive which becomes this invention is shown in the drawing 1 and the drawing 2. In addition, drawing 1 is a bottom plan view which looked at the pickup drive from the lower part. The pickup drive 1 is attached in the inferior surface of tongue of the base 2 where CD-ROM drive equipment is incorporated among both drawings. The base 2 is attached in the sub chassis (not shown) which supports the tray which is really fabricated by the product made from synthetic resin, for example, moves to a disk insertion position or the disk-swapping position besides equipment with a manual operation.

[0010] Moreover, each attachment section for attaching the pickup drive 1, the pickup 3, and the turntable 4 is prepared in the inferior surface of tongue of the base 2. The pickup drive 1 serves as more the guide shaft 8 which extends so that it may become parallel to the motor for a pickup drive 5 formed in the inferior surface of tongue of the base 2, the transmission device 6 which consists of two or more gears, the leading screw 7 driven through the transmission device 6, and the leading screw 7, and guides pickup 3.

[0011] Therefore, pickup 3 is formed so that opening 2a of the base 2 which extends in the disk radial may be countered, and both sides are guided to it by the leading screw 7 and the guide shaft 8 free [sliding]. And since pickup 3 has the engagement section 9 which engages with the thread part of a leading screw 7, if the rotation drive of the leading screw 7 is carried out by rotation of the motor for a pickup drive 5, it will be moved to the disk radial.

[0012] Moreover, a turntable 4 has a motor for a turntable drive in the lower part. This motor for a turntable drive will carry out the constant speed drive of the disk clamped on the turntable 4 at a fixed rotational frequency, if a tray 2 arrives at the predetermined insertion position in equipment 1. As shown in drawing 2, the 1st and the 2nd bearing 10 and 11 which carry out the bearing of the ends of a leading screw 7 are really fabricated by inferior-surface-of-tongue 2b of the above-mentioned base 2. Therefore, end 7a is inserted in bearing section 10a of the 1st bearing 10, the bearing of the leading screw 7 is carried out, and the bearing of the other end 7b is carried out to bearing section 11a of the 2nd bearing 11.

[0013] Moreover, the bearing of the guide shaft 8 is carried out by the 3rd by which ends 8a and 8b were really fabricated by inferior-surface-of-tongue 2b of the base 2, and the 4th bearing 17 and 18. As shown in drawing 3, the ring-like flange material 12 which has major diameter flange 12a has fitted into other end 7b of a leading screw 7 free [sliding]. Therefore, the bearing of the other end 7b of a leading screw 7 is inserted in and carried out to bearing section 12b prepared in the flange material 12 held at the 2nd bearing 11 by penetrating.

[0014] Moreover, fitting fixation of the gear 6a which constitutes the transmission device 6 is carried out, and the rotation driving force of the motor for a pickup drive 5 is transmitted to other end 7b of a leading screw 7 through the transmission device 6. as shown in drawing 2, the 1st bearing 10 and the 2nd bearing 11 are really fabricated to inferior-surface-of-tongue 2b of the base 2 -- having -- **** -- respectively -- ends 7a of a leading screw 7 -- it is prepared in the position corresponding to 7b

[0015] As shown in drawing 4, when the 1st bearing 10 is seen from shaft orientations, it has 10d of the horizontal-bridging sections constructed across horizontally between bearing section 10a made into the rectangle-like concavity, wall 10b which regulates the position of shaft orientations, opening 10c which is open for free passage to bearing section 10a so that end 7a of a leading screw 7 can insert from the upper part, and bearing section 10a and wall 10b. Moreover, between bearing section 10a and wall 10b, roll-off 10e larger than the periphery of end 7a of a leading screw 7 is formed.

[0016] Therefore, end 7a of a leading screw 7 is inserted in bearing section 10a from upside opening 10c so that it may mention later, and the position of shaft orientations is regulated in contact with wall 10b. Therefore, three end 7a of a leading screw 7 is supported by bearing section 10a of the 1st bearing 10, and is supported by 10d of the horizontal-bridging sections. As shown in drawing 5, the 2nd bearing 11 serves as more bearing section 11a formed in the shape of U character, opening 11b which is open for free passage to bearing section 11a, and slot 11c prepared in the internal surface of parietal bone of opening 11b, and the internal surface of parietal bone of bearing section 11a. The above-mentioned flange material 12 passes opening 11b with the status that it fitted into other end 7b of a leading screw 7, and is inserted in bearing section 11a. Flange 12a of the flange material 12 fits into slot 11c prepared in the internal surface of parietal bone of opening 11b, and the internal surface of parietal bone of bearing section 11a in that case.

[0017] Therefore, while the flange material 12 fits into bearing section 11a, when flange 12a fits into slot 11c, a move of shaft orientations is regulated. In addition, flange 12a has fitted in loosely to slot 11c, and the periphery of the flange material 12 contacts bearing section 11a. Moreover, the flange material 12 is held at the status that there is no shakiness while the defluxion from bearing section 11a is prevented since it is pressed by bearing section 11a of the 2nd bearing 11 by the press member 13 and it is fixed as shown in drawing 3.

[0018] The press member 13 is having rotation regulated by the boss 16 who projects from the attachment section 14 as shown in drawing 6 while it fixes on a screw 15 among the attachment section 14 which stands up on the inferior surface of tongue of the base 2. That is, 90 degrees of the press members 13 are bent, and they serve as 1st flat spring section 13b which inclines among the attachment section 14 (a dashed line shows among drawing 6) from fixed-part 13a by which installation fixation is carried out, and fixed-part 13a, and extends in longitudinal direction from fixed-part 13a from 2nd flat spring section 13c. the object for screws by which the above-mentioned screw 15 is inserted in fixed-part 13a -- 13d of holes, and the object for bosses into which a boss 16 fits -- a hole -- 13e is drilled

[0019] Moreover, from opening 11b of the 2nd above-mentioned bearing 11, in bearing section 11a, 1st flat spring section 13b extends aslant, and contacts at flange 12a of the flange material 12. Therefore, the flange material 12 is pressed in the orientation of A by 1st flat spring section 13b, and is held at bearing section 11a of the 2nd bearing 11. As 2nd flat spring section 13c is shown in drawing 6 (B), it is formed in the shape of J character, and 13f of the contact sections which extracted to the edge and were projected by manipulation is prepared. Therefore, other end 7b of a leading screw 7 is in contact with 13f of the contact sections, and is pressed in the orientation of B by 2nd flat spring section 13c.

[0020] therefore -- a leading screw -- seven -- the other end -- seven -- b -- the -- one -- flat spring -- the section -- 13 -- b -- a flange -- material -- 12 -- inside -- holding -- having -- while -- the -- two -- flat spring -- the section -- 13 -- c -- the -- one -- bearing -- ten -- a side -- pressing -- having had -- rotation -- free -- holding -- having . thereby -- a leading screw -- seven -- the above -- the -- one -- flat spring -- the section -- 13 -- b -- a flange -- material -- 12 -- inside -- holding -- having -- while -- the -- two -- flat spring -- the section -- 13 -- c -- the -- one -- bearing -- ten -- a side -- pressing -- having had -- rotation -- free -- holding -- having -- a sake -- pickup 3 -- stable -- it can support . Therefore, in order to stabilize pickup 3 in the disk radial and to move smoothly, the detection precision at the time of detecting the information recorded on the disk is secured.

[0021] Here, the work technique at the time of attaching a leading screw 7 in the above 1st and the 2nd bearing 10 and 11 is

explained. First, it is the opening 1 of the 1st bearing 10 about end 7a of a leading screw 7. As shown in view 7, in case a leading screw 7 is attached in the above 1st and the 2nd bearing 10 and 11, end 7a of a leading screw 7 is first inserted in opening 10c of the 1st bearing 10 from the orientation of slanting.

[0022] And as shown in drawing 8, while the flange material 12 which other end 7b of a leading screw 7 was rotated in the orientation of C, and fitted into other end 7b is inserted in bearing section 11a of the 2nd bearing 11, flange 12a is made to fit into slot 11c of bearing section 11a. Next, while the above-mentioned press member 13 is fixed among the attachment section 14, the flange material 12 is pressed to bearing section 11a of the 2nd bearing 11 by 1st flat spring section 13b, and other end 7b of a leading screw 7 is made to press in the orientation of B by 2nd flat spring section 13c.

[0023] Now, the bearing of the leading screw 7 is carried out free [rotation by the 1st and the 2nd bearing 10 and 11] for ends 7a and 7b. Thus, a leading screw 7 does not have the need of leaving the space for inserting a leading screw 7 in the shaft orientations of the 1st and the 2nd bearing 10 and 11 since it is attached from the orientation which intersects perpendicularly with shaft orientations rather than is inserted from shaft orientations to the 1st and the 2nd bearing 10 and 11 like before, and can correspond to a miniaturization of the base 2.

[0024] And since a leading screw 7 can be attached from the orientation which intersects perpendicularly to inferior-surface-of-tongue 2b of the base 2, it cannot require time for assembly operation, but can raise assembly-operation luminous efficacy. Moreover, since it is possible to exchange a leading screw 7 easily even if a leading screw 7 is damaged, for example after an assembly completion, the maintenance at the time of a repair and check can be performed for a short time.

[0025] Moreover, since the 3rd bearing 17 which carries out the bearing of the end 8a of the guide shaft 8 is the same configuration as the 1st above-mentioned bearing 10, the explanation is omitted. The 4th bearing 18 which carries out the bearing of the other end 8b of the guide shaft 8 consists of the press section 19 prepared in inferior-surface-of-tongue 2b of the base 2 as shown in drawing 9, and the fitting section 20 which stands up in the position which adjoins the press section 19 of inferior-surface-of-tongue 2b of the base 2. The press section 19 is perpendicularly projected at the nose of cam of spring section 19a surrounded by the slit 21 of the shape of a ** character drilled in the base 2, and spring section 19a, and consists of the contact section 19b which contacts the end face of other end 8b.

[0026] other end 8b of the guide shaft 8 -- the hole of the fitting section 20 -- it is held in the status that it is inserted in 20a and there is no shakiness of the orientation of a path, and is held in the status that it is pressed in the orientation (the 3rd bearing 17 side) of C by the press section 19, and there is no shakiness of shaft orientations in case the above-mentioned guide shaft 8 is attached so that a bearing may be carried out to the 3rd and the 4th bearing 17 and 18, as shown in drawing 10, spring section 19a of the press section 19 is bent in the orientation of D -- making -- end 8a of the guide shaft 8 -- the hole of the fitting section 20 -- it is made to insert in 20a And the guide shaft 8 is slid in the orientation of C, and it is made to insert in the 3rd bearing 17.

[0027] Next, if other end 8b of the guide shaft 8 passes contact section 19b of the press section 19, the press section 19 will press other end 8b of the guide shaft 8 in the orientation of C, as spring section 19a returns to the original status and shows in drawing 9. thus, spring section 19a of the press section 19 is bent -- making -- contact section 19b -- the hole of the fitting section 20 -- the hole from the position which counters 20a -- if a variation rate is carried out to the position from which it separated to 20a -- the guide shaft 8 -- easy -- the hole of the fitting section 20 -- it can be made to insert in the 3rd bearing 17 inserted in 20a Therefore, since the bearing of the guide shaft 8 can be carried out to the 3rd and the 4th bearing 17 and 18 by comparatively easy operation, assembly operation can perform it for a short time.

[0028] In addition, you may adopt the 2nd bearing 11 mentioned above instead of the 4th above-mentioned bearing 18. Moreover, not only the CD-ROM drive equipment like the above-mentioned example but in the case of other disk-like record media, for example, CD, a magnetic disk, a magneto-optic disk, and an optical disk, this invention is applied similarly.

[0029] Moreover, although the tray moved with the manual operation in the above-mentioned example, of course, it is applicable not only to this but the equipment of a configuration of that this invention moves a tray by drive meanses, such as a motor.

[0030]

[Effect of the Invention] Since it was enabled like **** to insert a leading screw or a guide shaft in the bearing section from opening in which it was prepared by bearing according to the above-mentioned this invention, while assembly operation of a leading screw or a guide shaft could be performed easily and assembly-operation luminous efficacy could be raised, when a leading screw or a guide shaft is damaged, for example, only a leading screw or a guide shaft can be exchanged easily, and the maintenance at the time of a repair and check can be performed for a short time.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the plan of one example of the pickup drive which becomes this invention.

[Drawing 2] They are the 1st prepared in the tray, and the side elevation showing the 2nd bearing.

[Drawing 3] Flange material is drawing of longitudinal section showing the status that the bearing was carried out to the 2nd bearing.

[Drawing 4] It is drawing for explaining the 1st bearing.

[Drawing 5] It is drawing for explaining the 2nd bearing.

[Drawing 6] It is drawing for explaining a press member.

[Drawing 7] It is a side elevation for explaining the operating instruction at the time of attaching a leading screw in the 1st and the 2nd bearing.

[Drawing 8] A leading screw is the side elevation showing the status that the bearing was carried out to the 1st and the 2nd bearing.

[Drawing 9] It is drawing for explaining the 4th bearing.

[Drawing 10] It is a side elevation for explaining the operating instruction at the time of attaching a guide shaft in the 4th bearing.

[Description of Notations]

- 1 Pickup Drive
- 2 Base
- 3 Pickup
- 4 Turntable
- 5 Motor for Pickup Drive
- 6 Transmission Device
- 7 Leading Screw
- 8 Guide Rail
- 10 1st Bearing
- 11 2nd Bearing
- 11a Bearing section
- 12 Flange Material
- 13 Press Member
- 13b The 1st flat spring section
- 13c The 2nd flat spring section
- 17 3rd Bearing
- 18 9th Bearing
- 19 Press Section
- 20 Fitting Section

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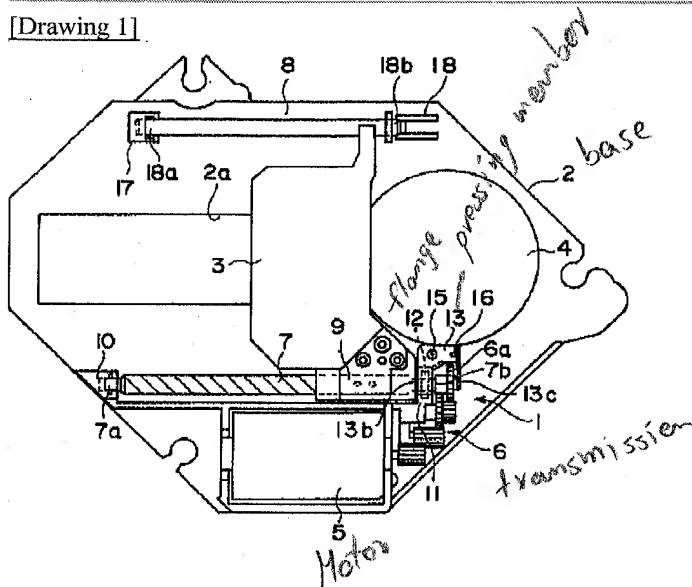
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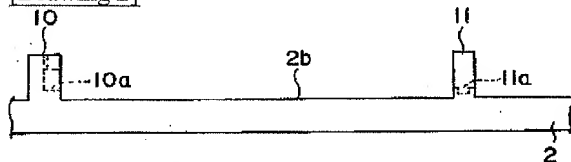
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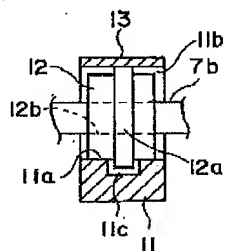
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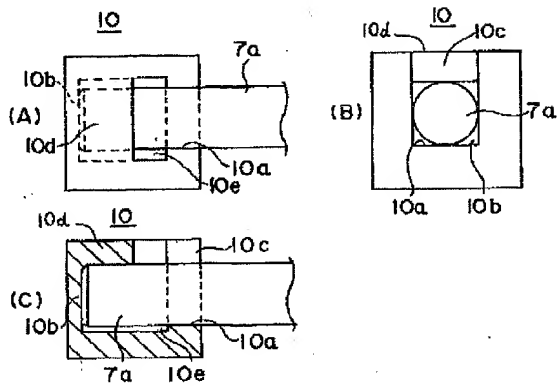
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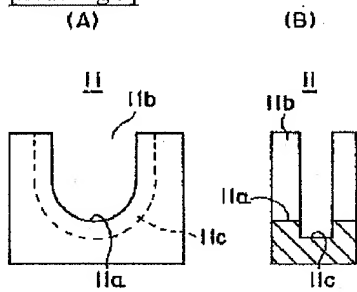
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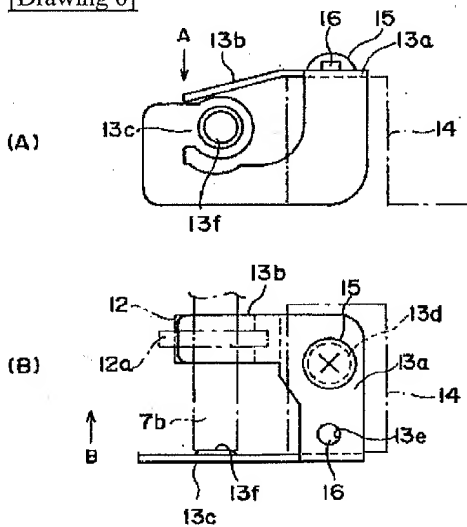
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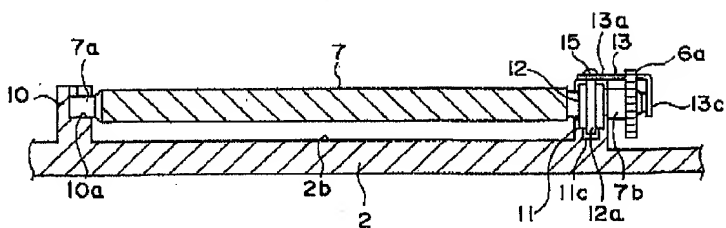
[Drawing 5]



[Drawing 6]



[Drawing 8]



[Drawing 7]

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